

```
=> fil reg
FILE 'REGISTRY' ENTERED AT 12:37:56 ON 02 SEP 2009
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```

Property values tagged with IC are from the ZIC/VINITI data file provided by InfoChem.

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STRUCTURE FILE UPDATES:    1 SEP 2009  HIGHEST RN 1179012-51-1
DICTIONARY FILE UPDATES:   1 SEP 2009  HIGHEST RN 1179012-51-1
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New CAS Information Use Policies, enter HELP USAGETERMS for details.

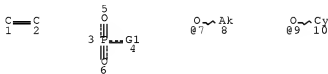
ISCA INFORMATION NOW CURRENT THROUGH June 26, 2009.

Please note that search-term pricing does apply when conducting SmartSELECT searches.

REGISTRY includes numerically searchable data for experimental and predicted properties as well as tags indicating availability of experimental property data in the original document. For information on property searching in REGISTRY, refer to:

<http://www.cas.org/support/stngen/stndoc/properties.html>

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=> d que stat l23
L21          STR
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VAR G1=OH/7/9
NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
GGCAT IS SAT AT 8
GGCAT IS UNS AT 10
DEFAULT ECLEVEL IS LIMITED
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GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 10
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STEREO ATTRIBUTES: NONE
L23          38115 SEA FILE=REGISTRY SSS FUL L21
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100.0% PROCESSED  92437 ITERATIONS          38115 ANSWERS
SEARCH TIME: 00.00.01
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=> d his l21-
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(FILE 'REGISTRY' ENTERED AT 12:07:09 ON 02 SEP 2009)

FILE 'LREGISTRY' ENTERED AT 12:32:10 ON 02 SEP 2009
L21 STR

FILE 'REGISTRY' ENTERED AT 12:33:23 ON 02 SEP 2009
L22 50 S L21
L23 38115 S L21 FUL
SAV TEMP PEZ387B/A L23

FILE 'HCAPLUS' ENTERED AT 12:34:10 ON 02 SEP 2009
L24 8249 S L23/P
L25 QUE ELECTROLYT?
L26 147 S L23(L)L25
L27 QUE ?POLYMER?(3N)FILM
L28 12 S L26 AND L27
L29 3 S L28 AND (PY<=2002 OR PRY<=2002 OR AY<=2002)

FILE 'REGISTRY' ENTERED AT 12:37:56 ON 02 SEP 2009

FILE 'HCAPLUS' ENTERED AT 12:38:10 ON 02 SEP 2009

=> fil hcap
FILE 'HCAPLUS' ENTERED AT 12:38:10 ON 02 SEP 2009
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FILE COVERS 1907 - 2 Sep 2009 VOL 151 ISS 10
FILE LAST UPDATED: 1 Sep 2009 (20090901/ED)
REVISED CLASS FIELDS (/NCL) LAST RELOADED: Jun 2009
USPTO MANUAL OF CLASSIFICATIONS THESAURUS ISSUE DATE: Jun 2009

HCAplus now includes complete International Patent Classification (IPC) reclassification data for the third quarter of 2009.

CAS Information Use Policies apply and are available at:

<http://www.cas.org/legal/infopolicy.html>

This file contains CAS Registry Numbers for easy and accurate substance identification.

The ALL, BIB, MAX, and STD display formats in the CA/CAPlus family of databases have been updated to include new citing references information. This enhancement may impact record import into database management software. For additional information, refer to NEWS 9.

=> d ibib abs hitstr hitind 129 1-3

L29 ANSWER 1 OF 3 HCAPLUS COPYRIGHT 2009 ACS on STN
 ACCESSION NUMBER: 2004:512797 HCAPLUS Full-text
 DOCUMENT NUMBER: 141:55484
 TITLE: Phosphoric acid-containing solid polymer
 electrolyte films and reinforced
 composite films using them with excellent proton
 conductivity, heat and chemical resistance, and
 mechanical strength
 INVENTOR(S): Rikukawa, Masahiro; Kanzaki, Yoshio; Ito,
 Koreatsu
 PATENT ASSIGNEE(S): Uni-Chemical Co., Ltd., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 52 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004179154	A	20040624	JP 2003-375561	20031105

PRIORITY APPLN. INFO.: <--
 JP 2002-328845 A 20021112

AB The films, useful for MeOH fuel cells, contain polymers (A) prepared from unsatd. monomers, bearing 1 of acidic phosphoric acid group and 1-3 of ethylenically unsatd. bond(s), or their mixts. and polyamides (B, N-methoxymethylated nylon, preferably),. Thus, impregnating a glass fiber nonwoven fabric with a composition containing methacryloyloxyethyl phosphate 55.6, di(methacryloyloxyethyl) phosphate 27.7, and Toresin EF 30T (polyamide) 16.7 parts, placing it between glass plates, irradiating it with UV, and heating it at 130° for 3 min gave a sheet with good MeOH resistance.

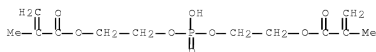
IT 76067-46-4P, Bis[2-(methacryloyloxy)ethyl] phosphate copolymer
 708211-68-1P
 RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(solid electrolyte films containing phosphate-containing acrylic polymers and polyamides for fuel cells with good proton conductivity, heat and chemical resistance, and mech. strength)

RN 76067-46-4 HCAPLUS
 CN 2-Propenoic acid, 2-methyl-, 1,1'-[phosphinobis(oxy-2,1-ethanediyl)] ester, polymer with 2-(phosphonoxy)ethyl 2-methyl-2-propenoate (CA INDEX NAME)

CM 1

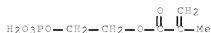
CRN 32435-46-4
 CMF C12 H19 O8 P



CM 2

CRN 24599-21-1

CMF C6 H11 O6 P



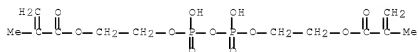
RN 708211-68-1 HCAPLUS

CN 2-Propenoic acid, 2-methyl-,
4,6-dihydroxy-4,6-dioxido-3,5,7-trioxa-4,6-diphosphanonane-1,9-diyl
ester, polymer with phosphinicobis(oxy-2,1-ethanediyl)
bis(2-methyl-2-propenoate) and 2-(phosphonooxy)ethyl
2-methyl-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 61988-50-9

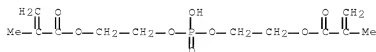
CMF C12 H20 O11 P2



CM 2

CRN 32435-46-4

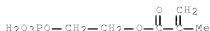
CMF C12 H19 O8 P



CM 3

CRN 24599-21-1

CMF C6 H11 O6 P



IC ICM H01B001-06
 ICS C08F220-26; C08F290-06; H01M008-02; H01M008-10
 CC 38-3 (Plastics Fabrication and Uses)
 Section cross-reference(s): 52
 IT Fuel cells
 Plastic films
 Polymer electrolytes
 (solid electrolyte films containing phosphate-containing acrylic polymers and polyamides for fuel cells with good proton conductivity, heat and chemical resistance, and mech. strength)
 IT Polymer blends
 Reinforced plastics
 RL: TEM (Technical or engineered material use); USES (Uses)
 (solid electrolyte films containing phosphate-containing acrylic polymers and polyamides for fuel cells with good proton conductivity, heat and chemical resistance, and mech. strength)
 IT 76067-46-4P, Bis[2-(methacryloyloxy)ethyl] phosphate-mono[2-(methacryloyloxy)ethyl] phosphate copolymer
 708211-68-1P
 RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (solid electrolyte films containing phosphate-containing acrylic polymers and polyamides for fuel cells with good proton conductivity, heat and chemical resistance, and mech. strength)

L29 ANSWER 2 OF 3 HCAPLUS COPYRIGHT 2009 ACS ON STN
 ACCESSION NUMBER: 2003:719543 HCAPLUS [Full-text](#)
 DOCUMENT NUMBER: 139:248013
 TITLE: Manufacture of proton-conducting fuel cell electrolyte membrane having reduced methanol permeability
 INVENTOR(S): Kiefer, Joachim; Uensal, Oemer; Calundann, Gordon; Crivello, James
 PATENT ASSIGNEE(S): Celanese Ventures GmbH, Germany
 SOURCE: PCT Int. Appl., 58 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: German
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003074597	A1	20030912	WO 2003-EP2397	20030304

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W: BR, CA, CN, JP, KR, MX, US
 RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU,
 IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR
 DE 10209685 A1 20030918 DE 2002-10209685

				20020306
			<--	
DE 10210499	A1	20030925	DE 2002-10210499	20020311
			<--	
CA 2478530	A1	20030912	CA 2003-2478530	20030304
			<--	
EP 1483316	A1	20041208	EP 2003-743390	20030304
			<--	
EP 1483316	B1	20070919		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,				
PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, SK				
JP 2005519428	T	20050630	JP 2003-573059	20030304
			<--	
CN 1639239	A	20050713	CN 2003-805300	20030304
			<--	
CN 1277869	C	20061004		
AT 373690	T	20071015	AT 2003-743390	20030304
			<--	
ES 2292993	T3	20080316	ES 2003-743390	20030304
			<--	
US 20050118477	A1	20050602	US 2005-506387	20050125
			<--	
PRIORITY APPLN. INFO.:			DE 2002-10209685	A 20020306
			<--	
			DE 2002-10210499	A 20020311
			<--	
			WO 2003-EP2397	W 20030304

AB A title membrane was manufactured by (A) swelling a polymer film with a liquid comprising vinylsulfonic acid and (B) polymerization of the vinylsulfonic acid present in the liquid used in step (A). For example, heating aqueous solution containing vinylsulfonic acid (obtained by acidification of Na vinylsulfonate with acidic ion exchanger) and vinylphosphonic acid for 1 h at 70°, adding CN-120 (epoxy acrylate) and Irgacure 184, heating the solution for 30 min at 70°, immersing a polybenzimidazole film in the mixture and heating for 3 h at 80°, placing the resulting film between transparent polypropylene (PP) films,

irradiating both sides of the laminate and separating PP films gave a title membrane. The typical weight gain of the membrane was 350%.

IT 596130-67-5P, CN 120-Vinylphosphonic acid-Vinylsulfonic acid copolymer 596130-68-6P, CN 120-Styrenesulfonic acid-Vinylphosphonic acid copolymer

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(membrane; manufacture of vinylsulfonic acid copolymer proton-conducting fuel cell electrolyte membrane)

RN 596130-67-5 HCAPLUS

CN Phosphonic acid, ethenyl-, polymer with CN 120 and ethenesulfonic acid (9CI) (CA INDEX NAME)

CM 1

CRN 163206-65-3

CMF Unspecified

CCI PMS, MAN

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CM 2

CRN 1746-03-8

CMF C2 H5 O3 P



CM 3

CRN 1184-84-5

CMF C2 H4 O3 S



RN 596130-68-6 HCAPLUS

CN Phosphonic acid, ethenyl-, polymer with CN 120 and ethenylbenzenesulfonic acid (9CI) (CA INDEX NAME)

CM 1

CRN 163206-65-3

CMF Unspecified

CCI PMS, MAN

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CM 2

CRN 26914-43-2

CMF C8 H8 O3 S

CCI IDS



D1—CH=CH₂

D1—SO₃H

CM 3

CRN 1746-03-8

CMF C2 H5 O3 P

H₂C=CH—PO₃H₂

IC ICM C08J007-16
ICS H01M008-10; C08J005-22
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 35, 38
ST polyvinylsulfonic acid polybenzimidazole film proton conducting
electrolyte membrane manuf; polybenzimidazole film
vinylsulfonic vinylphosphonic acid polyma fuel cell
membrane; proton conducting membrane manuf vinylsulfonic acid epoxy
acrylate polymer
IT 596130-67-5P, CN 120-Vinylphosphonic acid-Vinylsulfonic
acid copolymer 596130-68-6P, CN 120-Styrenesulfonic
acid-Vinylphosphonic acid copolymer
RL: IMF (Industrial manufacture); TEM (Technical or engineered
material use); PREP (Preparation); USES (Uses)
(membrane; manufacture of vinylsulfonic acid copolymer
proton-conducting fuel cell electrolyte membrane)
OS.CITING REF COUNT: 4 THERE ARE 4 CAPLUS RECORDS THAT CITE THIS
RECORD (6 CITINGS)
REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN
THE RE FORMAT

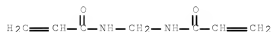
L29 ANSWER 3 OF 3 HCAPLUS COPYRIGHT 2009 ACS ON STN
ACCESSION NUMBER: 2003:719542 HCAPLUS Full-text
DOCUMENT NUMBER: 139:248012
TITLE: Manufacture of proton-conducting electrolyte
membrane for use at high temperatures and in
fuel cells
INVENTOR(S): Uensal, Oemer; Kiefer, Joachim
PATENT ASSIGNEE(S): Celanese Ventures GmbH, Germany
SOURCE: PCT Int. Appl., 59 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2003074596	A1	20030912	WO 2003-EP2399	20030304
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W: BR, CA, CN, JP, KR, MX, US				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU,				
IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR				
DE 10209419	A1	20030925	DE 2002-10209419	20020305
			<--	
CA 2477864	A1	20030912	CA 2003-2477864	20030304
			<--	
EP 1483314	A1	20041208	EP 2003-711950	20030304
			<--	
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,				
PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, SK				
CN 1649944	A	20050803	CN 2003-810121	20030304
			<--	
CN 100408616	C	20080806		
JP 2005527073	T	20050908	JP 2003-573058	20030304
			<--	
US 20050084727	A1	20050421	US 2004-506880	20041208
			<--	
PRIORITY APPLN. INFO.:			DE 2002-10209419	A 20020305
			<--	
			WO 2003-EP2399	W 20030304
AB	A title membrane is manufactured by (A) swelling a polymer film with a liquid containing a vinylphosphonic acid, and (B) polymerizing the vinylphosphonic acid present in the liquid introduced in step (A). For example, soaking a polybenzimidazole film for 1.5-2.5 h at 80° in a solution containing 1 part H2O and 10 parts 97% vinylphosphonic acid, soaking the swollen film in a solution containing 10 parts vinylphosphonic acid and 1 part aqueous solution containing 0.1% 2,2'-azobis(isobutyramidine)·2HCl and heating the film for 1 h at 80° gave a title membrane having conductivity 15.3 mS/cm (160°).			
IT	161035-26-3P, N,N'-Methylenebisacrylamide-Vinylphosphonic acid copolymer			
	RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)			
	(crosslinked, membrane; manufacture of proton-conducting electrolyte membrane for use at high temps. and in fuel			

cells)
RN 161035-26-3 HCAPLUS
CN Phosphonic acid, ethenyl-, polymer with
N,N'-methylenebis[2-propenamide] (9CI) (CA INDEX NAME)
CM 1
CRN 1746-03-8
CMF C2 H5 O3 P



CM 2
CRN 110-26-9
CMF C7 H10 N2 O2



IT 27754-99-0P, Vinylphosphonic acid polymer
596044-62-1P, CN 120-Vinylphosphonic acid copolymer
RL: IMF (Industrial manufacture); TEM (Technical or engineered
material use); PREP (Preparation); USES (Uses)
(membrane; manufacture of proton-conducting electrolyte
membrane for use at high temps. and in fuel cells)
RN 27754-99-0 HCAPLUS
CN Phosphonic acid, P-ethenyl-, homopolymer (CA INDEX NAME)
CM 1
CRN 1746-03-8
CMF C2 H5 O3 P



RN 596044-62-1 HCAPLUS
CN Phosphonic acid, ethenyl-, polymer with CN 120 (9CI) (CA INDEX
NAME)
CM 1
CRN 163206-65-3
CMF Unspecified
CCI PMS, MAN

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CM 2

CRN 1746-03-8
CMF C2 H5 O3 P

H2C=CH-PO3H2

IC ICM C08J005-22
ICS C08K005-5317
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 35, 38
ST proton conducting electrolyte membrane manuf vinylphosphonic acid
polymer; polybenzimidazole film vinylphosphonic acid
polymn fuel cell membrane manuf; polyvinylphosphonic acid
polybenzimidazole film proton conducting electrolyte membrane manuf
IT 161035-26-3P, N,N'-Methylenebisacrylamide-Vinylphosphonic
acid copolymer
RL: IMF (Industrial manufacture); TEM (Technical or engineered
material use); PREP (Preparation); USES (Uses)
(crosslinked, membrane; manufacture of proton-conducting
electrolyte membrane for use at high temps. and in fuel
cells)
IT 27754-99-0P, Vinylphosphonic acid polymer
596044-62-1P, CN 120-Vinylphosphonic acid copolymer
RL: IMF (Industrial manufacture); TEM (Technical or engineered
material use); PREP (Preparation); USES (Uses)
(membrane; manufacture of proton-conducting electrolyte
membrane for use at high temps. and in fuel cells)
OS.CITING REF COUNT: 9 THERE ARE 9 CAPLUS RECORDS THAT CITE THIS
RECORD (10 CITINGS)
REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN
THE RE FORMAT

=> d his

(FILE 'HOME' ENTERED AT 11:12:24 ON 02 SEP 2009)

FILE 'HCAPLUS' ENTERED AT 11:12:41 ON 02 SEP 2009
E US20050118477/PN

L1 1 S E3
SEL RN

FILE 'REGISTRY' ENTERED AT 11:13:57 ON 02 SEP 2009
2 S E1-2

L2 FILE 'STNGUIDE' ENTERED AT 11:14:16 ON 02 SEP 2009

FILE 'LREGISTRY' ENTERED AT 11:23:33 ON 02 SEP 2009
STR

L3 FILE 'REGISTRY' ENTERED AT 11:27:57 ON 02 SEP 2009
50 S L3

FILE 'STNGUIDE' ENTERED AT 11:44:09 ON 02 SEP 2009

FILE 'REGISTRY' ENTERED AT 11:54:31 ON 02 SEP 2009

L5 91115 S L3 FUL
SAV TEMP PEZ387/A L5
L6 2 S L2 AND L5
L7 1865 S L5 AND IDS/CI

FILE 'HCAPLUS' ENTERED AT 11:56:54 ON 02 SEP 2009

L8 20179 S L5/P
L9 QUE ELECTROLYT?
L10 1058 S L5(L)L9
L11 1 S L2
L12 609 S L8 AND L9
L13 QUE ?POLYMER?(3N)FILM
L14 QUE (POLYMERIZ? OR POLYMER?(2N)REACT?) (3N) (VINYL SULFON? O
L15 20 S L13 AND L14
L16 6 S L15 AND L8
L17 3 S L15 AND L12
L18 3 S L16 NOT L17
L19 16 S L15 AND (PY<=2002 OR PRY<=2002 OR AY<=2002)
L20 12 S L19 NOT L17-18

FILE 'REGISTRY' ENTERED AT 12:07:09 ON 02 SEP 2009

FILE 'HCAPLUS' ENTERED AT 12:07:15 ON 02 SEP 2009

FILE 'REGISTRY' ENTERED AT 12:30:38 ON 02 SEP 2009

FILE 'LREGISTRY' ENTERED AT 12:32:10 ON 02 SEP 2009

L21 STR

FILE 'REGISTRY' ENTERED AT 12:33:23 ON 02 SEP 2009

L22 50 S L21
L23 38115 S L21 FUL
SAV TEMP PEZ387B/A L23

FILE 'HCAPLUS' ENTERED AT 12:34:10 ON 02 SEP 2009

L24 8249 S L23/P
L25 QUE ELECTROLYT?
L26 147 S L23(L)L25
L27 QUE ?POLYMER?(3N)FILM
L28 12 S L26 AND L27
L29 3 S L28 AND (PY<=2002 OR PRY<=2002 OR AY<=2002)

FILE 'REGISTRY' ENTERED AT 12:37:56 ON 02 SEP 2009

FILE 'HCAPLUS' ENTERED AT 12:38:10 ON 02 SEP 2009

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